SEQUENCE LISTING

<110> BASF Plant Science GmbH

<120> Enhanced Amylose Production in Plants

<130> AE884-02

<140> PF0000054331
<141> 2003-03-07

<160> 24

<170> PatentIn Ver. 2.1

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        Gln Gly Phe Ile Gly Gly His Phe Pro Asp Leu Leu Asp Arg Pro Met
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                    260             265             270
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        Glu Met Ile Ala Val Leu Ile Gln Ser Ile Phe Tyr Leu Gly Ile Ile
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        Ala Val Thr Arg Leu Ala Arg Pro Asn Leu Ser Lys Leu Cys Tyr Arg
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        Ile Pro Cys Thr Val His Pro Leu Val Gly Trp Ser Leu Tyr Leu Leu
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    Val Phe Thr Tyr Ala Phe Cys Ala Ser Pro Ala Leu Trp Met Ala Leu
                  420                   425                   430

    Val Lys Ile Lys Cys Ser Leu His Val Ser Leu Glu Arg Glu Gly Phe
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                         Met Arg Gly Ser Leu Ala Gly Gly Pro Pro
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agt cct att gaa cct aga cag agg ctt tct gta ttc act gag gaa aca 220
Ser Pro Ile Glu Pro Arg Gln Arg Leu Ser Val Phe Thr Glu Glu Thr
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agc aaa aga agg ttc ttg aga agt aaa gtt ttc aga gat ggg gag aga 268
Ser Lys Arg Arg Phe Leu Arg Ser Lys Val Phe Arg Asp Gly Glu Arg
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gct ctt cat agt ccc acc aaa aac agg aat ttt acc tgc aag ttc cca 316
Ala Leu His Ser Pro Thr Lys Asn Arg Asn Phe Thr Cys Lys Phe Pro
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act gtg aag ctt ata ttg ggt gtt att gct ctg gtt gca att tgg tca 364
Thr Val Lys Leu Ile Leu Gly Val Ile Ala Leu Val Ala Ile Trp Ser
         60                   65                   70

ctc tgg cat tct cca gca att tat aac acg gaa tac ata tct agt tca 412
Leu Trp His Ser Pro Ala Ile Tyr Asn Thr Glu Tyr Ile Ser Ser Ser
     75                   80                   85                   90

ggc tct cgg gct gct ttg atg cac aga gag tta agt ggt cat tct tca 460
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          tcc caa gtt att gag aaa ctg gcc gat agg cat gag tat cag ggc gta   556
10        Ser Gln Val Ile Glu Lys Leu Ala Asp Arg His Glu Tyr Gln Gly Val
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          ggg ata tta aac ttc aat gac agt gaa att gat cag ttg aag gag tta   604
          Gly Ile Leu Asn Phe Asn Asp Ser Glu Ile Asp Gln Leu Lys Glu Leu
15                 140             145             150

          cta ccg gac gct gag cat gta atc ttg aac ctg gat cac gtc ccg aat   652
          Leu Pro Asp Ala Glu His Val Ile Leu Asn Leu Asp His Val Pro Asn
              155             160             165             170

20        aat ata aca tgg gaa aca ata tat cct gaa tgg ata gat gaa gaa gaa   700
          Asn Ile Thr Trp Glu Thr Ile Tyr Pro Glu Trp Ile Asp Glu Glu Glu
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          tct aag gac tgg tat aga gat gta gct cgt ttt cac ttg cag ctg gca   844
          Ser Lys Asp Trp Tyr Arg Asp Val Ala Arg Phe His Leu Gln Leu Ala
35                 220             225             230

          gca gca agg ctg gct gcc agt aat aaa ggg tat cat cca ata cat gtg   892
          Ala Ala Arg Leu Ala Ala Ser Asn Lys Gly Tyr His Pro Ile His Val
          235             240             245             250

40        ctt ctg gtt act gag cat ttc cca acc ccc aat ctg ttc acc tgt aaa   940
          Leu Leu Val Thr Glu His Phe Pro Thr Pro Asn Leu Phe Thr Cys Lys
                           255             260             265

45        gag tta gtt gta cgt gaa ggc aat gca tgg cta tat gaa cct aat ctg   988
          Glu Leu Val Val Arg Glu Gly Asn Ala Trp Leu Tyr Glu Pro Asn Leu
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          aac act tta aga gag aag ctc cac ctc cct gtt ggg tca tgt gaa ctt   1036
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          Ala Val Pro Leu Lys Ala Lys Ala Asn Trp His Ser Gly Asn Val Arg
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          cga gaa gcc tat gca act att ctc cac tca gca aat ttt tat gta tgt   1132
          Arg Glu Ala Tyr Ala Thr Ile Leu His Ser Ala Asn Phe Tyr Val Cys
          315             320             325             330

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335   340   345

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      Gly Leu Glu Ala Ala Gly Trp Lys Ile His Thr Ile Lys Arg Ile Arg
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      aat cct aaa gct gaa cag gat gcc tac aat gag tgg aac tat agc aaa    1324
      Asn Pro Lys Ala Glu Gln Asp Ala Tyr Asn Glu Trp Asn Tyr Ser Lys
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15    ttt cgt ctc tgg cag ctg aca gat tat gac aaa atc atc ttc att gat    1372
      Phe Arg Leu Trp Gln Leu Thr Asp Tyr Asp Lys Ile Ile Phe Ile Asp
      395             400             405             410

20    gcg gat ttg ttg ata ctg aga aat att gat ttt ctc ttt gag atg cct    1420
      Ala Asp Leu Leu Ile Leu Arg Asn Ile Asp Phe Leu Phe Glu Met Pro
                      415             420             425

      gaa ata act gca ata gga aat aat gca acc ctt ttt aat tca ggc gtg    1468
      Glu Ile Thr Ala Ile Gly Asn Asn Ala Thr Leu Phe Asn Ser Gly Val
25                    430             435             440

      atg gtc gtt gaa cca tca aat tgc aca ttt cag ctg ttg atg gat cat    1516
      Met Val Val Glu Pro Ser Asn Cys Thr Phe Gln Leu Leu Met Asp His
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      atc aat gag att gaa tca tac aat ggt ggg gat cag ggg tat ttg aac    1564
      Ile Asn Glu Ile Glu Ser Tyr Asn Gly Gly Asp Gln Gly Tyr Leu Asn
      460             465             470

35    gaa ata ttc acc tgg tgg cat agg atc cca aaa cac atg aac ttt ttg    1612
      Glu Ile Phe Thr Trp Trp His Arg Ile Pro Lys His Met Asn Phe Leu
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      aaa cat tat tgg gaa ggt gat gag gag gag aag aag caa atg aaa aca    1660
40    Lys His Tyr Trp Glu Gly Asp Glu Glu Glu Lys Lys Gln Met Lys Thr
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      cgt ctt ttt ggt gct gat cct cca gtt ctc tat gtt ctg cac tac tta    1708
      Arg Leu Phe Gly Ala Asp Pro Pro Val Leu Tyr Val Leu His Tyr Leu
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      ggc ctg aaa cct tgg tta tgc ttc agg gac tac gat tgc aac tgg aat    1756
      Gly Leu Lys Pro Trp Leu Cys Phe Arg Asp Tyr Asp Cys Asn Trp Asn
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      gtg ggt aag ttg cag gag ttt gca agt gat gtg gca cac agg acg tgg    1804
      Val Gly Lys Leu Gln Glu Phe Ala Ser Asp Val Ala His Arg Thr Trp
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      ctt agg tct aaa cag aag gct gca cta gag tgg gat cga aga gaa gct    1900
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      cca cgt ttg gag act tgt tat gaa gaa ttt tgc ttc tgg gaa agc atg    1996
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      tta tgg cac tgg ggt gaa aca aac tgg aca gat aat gcc acc tct tca    2044
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              620                 625                 630

      cca aca cct ccc atg gtc aat act gct tca ctt tct tct ttg            2086
      Pro Thr Pro Pro Met Val Asn Thr Ala Ser Leu Ser Ser Leu
      635                 640                 645

      taactaggag gttctgttac tatacctcgc tagtctgtaa gtaatacaga gtcacaactt  2146

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Gly Val Ile Ala Leu Val Ala Ile Trp Ser Leu Trp His Ser Pro Ala
65                  70                  75                  80

Ile Tyr Asn Thr Glu Tyr Ile Ser Ser Ser Gly Ser Arg Ala Ala Leu
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Met His Arg Glu Leu Ser Gly His Ser Ser Ala Asp Gln Arg Tyr Thr
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Ser Leu Leu Asp Ile Asp Trp Asp Gln Ile Ser Gln Val Ile Glu Lys
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Leu Ala Asp Arg His Glu Tyr Gln Gly Val Gly Ile Leu Asn Phe Asn
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      Trp Lys Ile His Thr Ile Lys Arg Ile Arg Asn Pro Lys Ala Glu Gln
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      Asp Ala Tyr Asn Glu Trp Asn Tyr Ser Lys Phe Arg Leu Trp Gln Leu
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45   Thr Asp Tyr Asp Lys Ile Ile Phe Ile Asp Ala Asp Leu Leu Ile Leu
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      Arg Asn Ile Asp Phe Leu Phe Glu Met Pro Glu Ile Thr Ala Ile Gly
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      Asn Asn Ala Thr Leu Phe Asn Ser Gly Val Met Val Val Glu Pro Ser
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      Tyr Asn Gly Gly Asp Gln Gly Tyr Leu Asn Glu Ile Phe Thr Trp Trp
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       Tyr Glu Glu Phe Cys Phe Trp Glu Ser Met Leu Trp His Trp Gly Glu
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        1               5               10              15

      ttg atc atc aaa acg aca gcg tat aac gag aaa cag ctg ttc cag ccg      96
      Leu Ile Ile Lys Thr Thr Ala Tyr Asn Glu Lys Gln Leu Phe Gln Pro
50                     20              25              30

      ctt gaa acg gaa aac gca aac gcg atg acc gcg gtt atg gag cga gga     144
      Leu Glu Thr Glu Asn Ala Asn Ala Met Thr Ala Val Met Glu Arg Gly
55            35              40              45

      tta aag acg cag cgg cgg ccg gag cac aag aac gct tat gcg acg atg     192
      Leu Lys Thr Gln Arg Arg Pro Glu His Lys Asn Ala Tyr Ala Thr Met
              50              55              60

60    atg tac atg gga aca cca aga gac tac gag ttc tac gtt gcg aca cgt     240
      Met Tyr Met Gly Thr Pro Arg Asp Tyr Glu Phe Tyr Val Ala Thr Arg
```

```
          65                    70                    75                    80

     gtc ttg atc aga tcg ctt aag agt ctc cac gtg gac gct gat atc gtc   288
     Val Leu Ile Arg Ser Leu Lys Ser Leu His Val Asp Ala Asp Ile Val
  5                  85                    90                    95

     gtt ata gcc tcc ctc gac gtt cct atc aac tgg att cac gct ctg gaa   336
     Val Ile Ala Ser Leu Asp Val Pro Ile Asn Trp Ile His Ala Leu Glu
                     100                   105                   110
 10
     gaa gaa gat gga gct aaa gta gtg aga gta gag aat ctt gag aat cca   384
     Glu Glu Asp Gly Ala Lys Val Val Arg Val Glu Asn Leu Glu Asn Pro
                     115                   120                   125

 15  tac aag aaa caa acc aac ttc gac aac aga ttc aag ctt agt cta aac   432
     Tyr Lys Lys Gln Thr Asn Phe Asp Asn Arg Phe Lys Leu Ser Leu Asn
         130                   135                   140

     aag ctc tac gct tgg tct ctc tct gat tat gac cgt gtt gta atg ctt   480
 20  Lys Leu Tyr Ala Trp Ser Leu Ser Asp Tyr Asp Arg Val Val Met Leu
         145                   150                   155                   160

     gat gtc gac aat ctc ttt ctc aag aac acc gac gag ctc ttc cag tgt   528
     Asp Val Asp Asn Leu Phe Leu Lys Asn Thr Asp Glu Leu Phe Gln Cys
 25                  165                   170                   175

     ggc caa ttt tgt gct gtc ttc atc aac cct tgc atc ttc cac act ggt   576
     Gly Gln Phe Cys Ala Val Phe Ile Asn Pro Cys Ile Phe His Thr Gly
                     180                   185                   190
 30
     ctc ttt gtg ttg cag cca tca atg gag gtc ttt aga gac atg ctt cat   624
     Leu Phe Val Leu Gln Pro Ser Met Glu Val Phe Arg Asp Met Leu His
                     195                   200                   205

 35  gag ctt gaa gta aag aga gat aac cct gat gga gct gat caa ggc ttt   672
     Glu Leu Glu Val Lys Arg Asp Asn Pro Asp Gly Ala Asp Gln Gly Phe
         210                   215                   220

     ctt gtc agc tac ttc tct gat tta ctc aat cag cct ctc ttt cgt cct   720
 40  Leu Val Ser Tyr Phe Ser Asp Leu Leu Asn Gln Pro Leu Phe Arg Pro
     225                   230                   235                   240

     cct ccc gat aac cgc acc gcg ctt aag gga cat ttt agg ctt cct ttg   768
     Pro Pro Asp Asn Arg Thr Ala Leu Lys Gly His Phe Arg Leu Pro Leu
 45                  245                   250                   255

     gga tat caa atg gac gca tct tat tac tac ctt aag ctc aga tgg aac   816
     Gly Tyr Gln Met Asp Ala Ser Tyr Tyr Tyr Leu Lys Leu Arg Trp Asn
                     260                   265                   270
 50
     gta cca tgt gga cca aac agt gtg ata acg ttc cca gga gca gta tgg   864
     Val Pro Cys Gly Pro Asn Ser Val Ile Thr Phe Pro Gly Ala Val Trp
             275                   280                   285

 55  tta aag cca tgg tat tgg tgg tca tgg cct gtt ctt cct tta ggc ctt   912
     Leu Lys Pro Trp Tyr Trp Trp Ser Trp Pro Val Leu Pro Leu Gly Leu
         290                   295                   300

     tca tgg cac cac caa cgc cgc tac acg att agt tat tca gca gag atg   960
 60  Ser Trp His His Gln Arg Arg Tyr Thr Ile Ser Tyr Ser Ala Glu Met
     305                   310                   315                   320
```

```
     cct tgg gtc cta acc caa gca gtg ttc tac cta gga att ata cta gtc   1008
     Pro Trp Val Leu Thr Gln Ala Val Phe Tyr Leu Gly Ile Ile Leu Val
                 325             330             335

     aca cgt cta gcg cgt ccc aac atg acc aag cta tgt tac cga cgt tct   1056
     Thr Arg Leu Ala Arg Pro Asn Met Thr Lys Leu Cys Tyr Arg Arg Ser
                 340             345             350

     gat aag aat cta agc atg atc cag aca gct ttc aag ttt gtt gca ctc   1104
     Asp Lys Asn Leu Ser Met Ile Gln Thr Ala Phe Lys Phe Val Ala Leu
                 355             360             365

     ctc ttt atc ctc tca gcc tac att ata cca ttc ttc atc atc cca cag   1152
     Leu Phe Ile Leu Ser Ala Tyr Ile Ile Pro Phe Phe Ile Ile Pro Gln
                 370             375             380

     acg atc cac ccg ctc att ggt tgg tct ctc tac tta acc ggc tcc ttt   1200
     Thr Ile His Pro Leu Ile Gly Trp Ser Leu Tyr Leu Thr Gly Ser Phe
     385             390             395             400

     gct ctc tct acc ata ccc atc aac gcc ttc ttg ctt ccc att ctc cct   1248
     Ala Leu Ser Thr Ile Pro Ile Asn Ala Phe Leu Leu Pro Ile Leu Pro
                 405             410             415

     gtc ata aca ccg tgg ctt ggc att ttc ggg aca ctc ctc gtg atg gct   1296
     Val Ile Thr Pro Trp Leu Gly Ile Phe Gly Thr Leu Leu Val Met Ala
                 420             425             430

     ttt cct tct tat cct gat ggc gtt gtt aga gca ttg tcg gtt ttc ggg   1344
     Phe Pro Ser Tyr Pro Asp Gly Val Val Arg Ala Leu Ser Val Phe Gly
                 435             440             445

     tat gca ttt tgt tgt gca ccg ttt cta tgg gtc tcc ttt gtg aag atc   1392
     Tyr Ala Phe Cys Cys Ala Pro Phe Leu Trp Val Ser Phe Val Lys Ile
     450             455             460

     aca tcg cat ctt cag att atg att gac aaa gag gtt ttg ttt ccg cgg   1440
     Thr Ser His Leu Gln Ile Met Ile Asp Lys Glu Val Leu Phe Pro Arg
     465             470             475             480

     ttg ggt gaa tcc gga gtc act tct ggt ctc agc aaa ttg tac tga       1485
     Leu Gly Glu Ser Gly Val Thr Ser Gly Leu Ser Lys Leu Tyr
                 485             490             495
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Met Asp Leu Gln Arg Thr Leu Met Phe Ser Cys Trp Val Leu Ser Leu
1               5               10              15
Leu Ile Ile Lys Thr Thr Ala Tyr Asn Glu Lys Gln Leu Phe Gln Pro
            20              25              30
Leu Glu Thr Glu Asn Ala Asn Ala Met Thr Ala Val Met Glu Arg Gly
        35              40              45
Leu Lys Thr Gln Arg Arg Pro Glu His Lys Asn Ala Tyr Ala Thr Met
    50              55              60
Met Tyr Met Gly Thr Pro Arg Asp Tyr Glu Phe Tyr Val Ala Thr Arg
```

```
           65                    70                    75                    80
      Val Leu Ile Arg Ser Leu Lys Ser Leu His Val Asp Ala Asp Ile Val
                         85                    90                    95
 5    Val Ile Ala Ser Leu Asp Val Pro Ile Asn Trp Ile His Ala Leu Glu
                        100                   105                   110
      Glu Glu Asp Gly Ala Lys Val Val Arg Val Glu Asn Leu Glu Asn Pro
                    115                   120                   125
      Tyr Lys Lys Gln Thr Asn Phe Asp Asn Arg Phe Lys Leu Ser Leu Asn
                    130                   135                   140
10    Lys Leu Tyr Ala Trp Ser Leu Ser Asp Tyr Asp Arg Val Val Met Leu
      145                   150                   155                   160
      Asp Val Asp Asn Leu Phe Leu Lys Asn Thr Asp Glu Leu Phe Gln Cys
                        165                   170                   175
      Gly Gln Phe Cys Ala Val Phe Ile Asn Pro Cys Ile Phe His Thr Gly
15                      180                   185                   190
      Leu Phe Val Leu Gln Pro Ser Met Glu Val Phe Arg Asp Met Leu His
                    195                   200                   205
      Glu Leu Glu Val Lys Arg Asp Asn Pro Asp Gly Ala Asp Gln Gly Phe
                    210                   215                   220
20    Leu Val Ser Tyr Phe Ser Asp Leu Leu Asn Gln Pro Leu Phe Arg Pro
      225                   230                   235                   240
      Pro Pro Asp Asn Arg Thr Ala Leu Lys Gly His Phe Arg Leu Pro Leu
                        245                   250                   255
      Gly Tyr Gln Met Asp Ala Ser Tyr Tyr Tyr Leu Lys Leu Arg Trp Asn
25                      260                   265                   270
      Val Pro Cys Gly Pro Asn Ser Val Ile Thr Phe Pro Gly Ala Val Trp
                    275                   280                   285
      Leu Lys Pro Trp Tyr Trp Trp Ser Trp Pro Val Leu Pro Leu Gly Leu
                    290                   295                   300
30    Ser Trp His His Gln Arg Arg Tyr Thr Ile Ser Tyr Ser Ala Glu Met
      305                   310                   315                   320
      Pro Trp Val Leu Thr Gln Ala Val Phe Tyr Leu Gly Ile Ile Leu Val
                        325                   330                   335
      Thr Arg Leu Ala Arg Pro Asn Met Thr Lys Leu Cys Tyr Arg Arg Ser
35                      340                   345                   350
      Asp Lys Asn Leu Ser Met Ile Gln Thr Ala Phe Lys Phe Val Ala Leu
                    355                   360                   365
      Leu Phe Ile Leu Ser Ala Tyr Ile Ile Pro Phe Phe Ile Ile Pro Gln
                    370                   375                   380
40    Thr Ile His Pro Leu Ile Gly Trp Ser Leu Tyr Leu Thr Gly Ser Phe
      385                   390                   395                   400
      Ala Leu Ser Thr Ile Pro Ile Asn Ala Phe Leu Leu Pro Ile Leu Pro
                    405                   410                   415
      Val Ile Thr Pro Trp Leu Gly Ile Phe Gly Thr Leu Leu Val Met Ala
45                      420                   425                   430
      Phe Pro Ser Tyr Pro Asp Gly Val Val Arg Ala Leu Ser Val Phe Gly
                    435                   440                   445
      Tyr Ala Phe Cys Cys Ala Pro Phe Leu Trp Val Ser Phe Val Lys Ile
                    450                   455                   460
50    Thr Ser His Leu Gln Ile Met Ile Asp Lys Glu Val Leu Phe Pro Arg
      465                   470                   475                   480
      Leu Gly Glu Ser Gly Val Thr Ser Gly Leu Ser Lys Leu Tyr
                        485                   490
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<222> (1)..(1494)

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Met Asp Leu Gln Arg Gly Phe Val Phe Leu Ser Leu Val Leu Ser Phe
1               5                   10                  15

atg ata atc gaa acg acg gcg tat cga gag aga cag ctg ctg ctg ctg    96
Met Ile Ile Glu Thr Thr Ala Tyr Arg Glu Arg Gln Leu Leu Leu Leu
            20                  25                  30

caa cca ccg caa gaa acg gcg ata gat acc gca aac gcg gtg gtg acg   144
Gln Pro Pro Gln Glu Thr Ala Ile Asp Thr Ala Asn Ala Val Val Thr
        35                  40                  45

gtt caa gat cga ggt ttg aag acg cgg cga ccg gag cat aag aac gca   192
Val Gln Asp Arg Gly Leu Lys Thr Arg Arg Pro Glu His Lys Asn Ala
    50                  55                  60

tac gca acg atg atg tac atg ggg acg cca aga gac tac gag ttc tac   240
Tyr Ala Thr Met Met Tyr Met Gly Thr Pro Arg Asp Tyr Glu Phe Tyr
65                  70                  75                  80

gtt gcg aca cgt gtt ttg atc aga tcg ttg aga agt ctt cac gtg gaa   288
Val Ala Thr Arg Val Leu Ile Arg Ser Leu Arg Ser Leu His Val Glu
                85                  90                  95

gct gat ctc gtc gtc atc gct tct ctc gac gtt cct ctc cga tgg gtt   336
Ala Asp Leu Val Val Ile Ala Ser Leu Asp Val Pro Leu Arg Trp Val
            100                 105                 110

caa acc ttg gaa gag gaa gat gga gct aaa gtg gtg aga gtt gaa aat   384
Gln Thr Leu Glu Glu Glu Asp Gly Ala Lys Val Val Arg Val Glu Asn
        115                 120                 125

gtg gat aat cca tac agg aga cag acc aac ttc aac agt aga ttc aag   432
Val Asp Asn Pro Tyr Arg Arg Gln Thr Asn Phe Asn Ser Arg Phe Lys
    130                 135                 140

ctt act cta aac aag ctc tac gct tgg gct ttg tct gat tac gac cgt   480
Leu Thr Leu Asn Lys Leu Tyr Ala Trp Ala Leu Ser Asp Tyr Asp Arg
145                 150                 155                 160

gtg gtc atg cta gat gcc gat aac ctc ttt ctt aag aaa gcc gac gag   528
Val Val Met Leu Asp Ala Asp Asn Leu Phe Leu Lys Lys Ala Asp Glu
                165                 170                 175

ttg ttc cag tgt ggg cgc ttc tgt gcg gtc ttc att aac cct tgt atc   576
Leu Phe Gln Cys Gly Arg Phe Cys Ala Val Phe Ile Asn Pro Cys Ile
            180                 185                 190

ttc cac act ggt ctc ttc gtg ttg cag cca tca gtg gaa gtg ttc aag   624
Phe His Thr Gly Leu Phe Val Leu Gln Pro Ser Val Glu Val Phe Lys
        195                 200                 205

gac atg ctc cat gag cta caa gtt gga aga aag aat cct gat gga gct   672
Asp Met Leu His Glu Leu Gln Val Gly Arg Lys Asn Pro Asp Gly Ala
    210                 215                 220
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      gat caa ggt ttt ctt gtc agt tac ttc tct gat ctt ctt gac caa cct   720
      Asp Gln Gly Phe Leu Val Ser Tyr Phe Ser Asp Leu Leu Asp Gln Pro
      225             230             235             240

 5    ctc ttt agt cct ccg agt aac gga tct gta ctt aat ggt cac ttg aga   768
      Leu Phe Ser Pro Pro Ser Asn Gly Ser Val Leu Asn Gly His Leu Arg
                      245             250             255

10    ctt ccc tta ggc tac caa atg gac gct tct tat ttc tat ctt aag cta   816
      Leu Pro Leu Gly Tyr Gln Met Asp Ala Ser Tyr Phe Tyr Leu Lys Leu
                  260             265             270

      aga tgg aac ata ccc tgt gga cca aac agt gtg att aca ttc ccg gga   864
15    Arg Trp Asn Ile Pro Cys Gly Pro Asn Ser Val Ile Thr Phe Pro Gly
                  275             280             285

      gct gtt tgg tta aag cca tgg tac tgg tgg tca tgg cct gtt ctt cca   912
      Ala Val Trp Leu Lys Pro Trp Tyr Trp Trp Ser Trp Pro Val Leu Pro
                  290             295             300
20
      cta ggt ttc tca tgg cac gag cag cgt cgc gcc act ata ggg tac tca   960
      Leu Gly Phe Ser Trp His Glu Gln Arg Arg Ala Thr Ile Gly Tyr Ser
      305             310             315             320

25    gcc gaa atg cct ttg gtt ata atc caa gca atg ttt tac ctt gga atc   1008
      Ala Glu Met Pro Leu Val Ile Ile Gln Ala Met Phe Tyr Leu Gly Ile
                      325             330             335

      ata gtg gtt aca cga cta gct cgt cct aac ata acc aag cta tgt tat   1056
30    Ile Val Val Thr Arg Leu Ala Arg Pro Asn Ile Thr Lys Leu Cys Tyr
                  340             345             350

      cgc cgc tct gac cgc aac tta aca acg atc caa gct ggt ttt aag ttg   1104
      Arg Arg Ser Asp Arg Asn Leu Thr Thr Ile Gln Ala Gly Phe Lys Leu
35                355             360             365

      atc gcg ctt ctc tct gta gtt gca gcc tac atc ttc cca ttc ttc acc   1152
      Ile Ala Leu Leu Ser Val Val Ala Ala Tyr Ile Phe Pro Phe Phe Thr
                  370             375             380
40
      atc cct cac act atc cac cca ctc atc ggc tgg tcg ctc tac ttg atg   1200
      Ile Pro His Thr Ile His Pro Leu Ile Gly Trp Ser Leu Tyr Leu Met
      385             390             395             400

45    gct tct ttt gct ctc tct tcc att tca atc aac act ctc ctc ctc cca   1248
      Ala Ser Phe Ala Leu Ser Ser Ile Ser Ile Asn Thr Leu Leu Leu Pro
                      405             410             415

      acg ctc cct gtt ctc act cca tgg cta gga att ctc ggc act ctc ctt   1296
50    Thr Leu Pro Val Leu Thr Pro Trp Leu Gly Ile Leu Gly Thr Leu Leu
                  420             425             430

      gtc atg gcc ttc cct tgg tac cct gat gga gtg gtc aga gcc ttg tca   1344
      Val Met Ala Phe Pro Trp Tyr Pro Asp Gly Val Val Arg Ala Leu Ser
55                435             440             445

      gtt ttc gca tac gca ttt tgt tgc gca ccc ttt gtg tgg gtt tca ttc   1392
      Val Phe Ala Tyr Ala Phe Cys Cys Ala Pro Phe Val Trp Val Ser Phe
      450             455             460
60
      cgc aaa atc aca tcg cac ctc cag gtt ttg att gag aaa gag gtg ttg   1440
```

```
    Arg Lys Ile Thr Ser His Leu Gln Val Leu Ile Glu Lys Glu Val Leu
    465             470             475             480

5   ttc ccg cga ttg gga gac tca ggg gtc act tca ggc ttc agc aaa ttg    1488
    Phe Pro Arg Leu Gly Asp Ser Gly Val Thr Ser Gly Phe Ser Lys Leu
                    485             490             495

    tat tag                                                            1494
    Tyr

10
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                    20              25              30
    Gln Pro Pro Gln Glu Thr Ala Ile Asp Thr Ala Asn Ala Val Val Thr
                35              40              45
    Val Gln Asp Arg Gly Leu Lys Thr Arg Arg Pro Glu His Lys Asn Ala
25      50              55              60
    Tyr Ala Thr Met Met Tyr Met Gly Thr Pro Arg Asp Tyr Glu Phe Tyr
    65              70              75              80
    Val Ala Thr Arg Val Leu Ile Arg Ser Leu Arg Ser Leu His Val Glu
                    85              90              95
30  Ala Asp Leu Val Val Ile Ala Ser Leu Asp Val Pro Leu Arg Trp Val
                    100             105             110
    Gln Thr Leu Glu Glu Glu Asp Gly Ala Lys Val Val Arg Val Glu Asn
                115             120             125
    Val Asp Asn Pro Tyr Arg Arg Gln Thr Asn Phe Asn Ser Arg Phe Lys
35      130             135             140
    Leu Thr Leu Asn Lys Leu Tyr Ala Trp Ala Leu Ser Asp Tyr Asp Arg
    145             150             155             160
    Val Val Met Leu Asp Ala Asp Asn Leu Phe Leu Lys Lys Ala Asp Glu
                    165             170             175
40  Leu Phe Gln Cys Gly Arg Phe Cys Ala Val Phe Ile Asn Pro Cys Ile
                    180             185             190
    Phe His Thr Gly Leu Phe Val Leu Gln Pro Ser Val Glu Val Phe Lys
                195             200             205
    Asp Met Leu His Glu Leu Gln Val Gly Arg Lys Asn Pro Asp Gly Ala
45      210             215             220
    Asp Gln Gly Phe Leu Val Ser Tyr Phe Ser Asp Leu Leu Asp Gln Pro
    225             230             235             240
    Leu Phe Ser Pro Pro Ser Asn Gly Ser Val Leu Asn Gly His Leu Arg
                    245             250             255
50  Leu Pro Leu Gly Tyr Gln Met Asp Ala Ser Tyr Phe Tyr Leu Lys Leu
                    260             265             270
    Arg Trp Asn Ile Pro Cys Gly Pro Asn Ser Val Ile Thr Phe Pro Gly
                275             280             285
    Ala Val Trp Leu Lys Pro Trp Tyr Trp Trp Ser Trp Pro Val Leu Pro
55      290             295             300
    Leu Gly Phe Ser Trp His Glu Gln Arg Arg Ala Thr Ile Gly Tyr Ser
    305             310             315             320
    Ala Glu Met Pro Leu Val Ile Ile Gln Ala Met Phe Tyr Leu Gly Ile
                    325             330             335
60  Ile Val Val Thr Arg Leu Ala Arg Pro Asn Ile Thr Lys Leu Cys Tyr
                    340             345             350
```

```
        Arg Arg Ser Asp Arg Asn Leu Thr Thr Ile Gln Ala Gly Phe Lys Leu
                355                     360             365
        Ile Ala Leu Leu Ser Val Val Ala Ala Tyr Ile Phe Pro Phe Phe Thr
            370                 375                 380
5       Ile Pro His Thr Ile His Pro Leu Ile Gly Trp Ser Leu Tyr Leu Met
        385                 390                 395                 400
        Ala Ser Phe Ala Leu Ser Ser Ile Ser Ile Asn Thr Leu Leu Leu Pro
                        405                 410                 415
        Thr Leu Pro Val Leu Thr Pro Trp Leu Gly Ile Leu Gly Thr Leu Leu
10                      420             425             430
        Val Met Ala Phe Pro Trp Tyr Pro Asp Gly Val Val Arg Ala Leu Ser
                435                 440                 445
        Val Phe Ala Tyr Ala Phe Cys Cys Ala Pro Phe Val Trp Val Ser Phe
            450                 455                 460
15      Arg Lys Ile Thr Ser His Leu Gln Val Leu Ile Glu Lys Glu Val Leu
        465                 470                 475                 480
        Phe Pro Arg Leu Gly Asp Ser Gly Val Thr Ser Gly Phe Ser Lys Leu
                        485                 490                 495
        Tyr
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        <210> 9
        <211> 1944
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30      <222> (1)..(1944)

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        Met His Pro Ala Ser Cys Ser Leu Ser Leu Arg Lys Val Lys Leu Asn
35       1               5                   10                  15

        att ctt aca gtg aga atg aag ctc tct tct gaa agt ccc atg gcg ccg    96
        Ile Leu Thr Val Arg Met Lys Leu Ser Ser Glu Ser Pro Met Ala Pro
                        20                  25                  30
40
        tca agt cag tca agt cat cga ctt tac att tcc agt gag aaa aca aaa   144
        Ser Ser Gln Ser Ser His Arg Leu Tyr Ile Ser Ser Glu Lys Thr Lys
                    35                  40                  45

45      acg aag aga ttc caa aga aac gga tac act ctc gat gtt gaa atg tgt   192
        Thr Lys Arg Phe Gln Arg Asn Gly Tyr Thr Leu Asp Val Glu Met Cys
                50                  55                  60

        gtc aac ttc tct agt ctg aaa ctt gtt ttg ttt ctt atg atg ctg gtt   240
50      Val Asn Phe Ser Ser Leu Lys Leu Val Leu Phe Leu Met Met Leu Val
        65                  70                  75                  80

        gct atg ttc aca ctc tac tgt tct cca ccg ttg caa att cct gaa gat   288
        Ala Met Phe Thr Leu Tyr Cys Ser Pro Pro Leu Gln Ile Pro Glu Asp
55                          85                  90                  95

        cca tca agt ttt gca aac aaa tgg ata cta gaa cct gct gta acc aca   336
        Pro Ser Ser Phe Ala Asn Lys Trp Ile Leu Glu Pro Ala Val Thr Thr
                        100                 105                 110
60
        gat cct cgc tat ata gct aca tct gag atc aac tgg aac agt atg tca   384
```

18

```
        Asp Pro Arg Tyr Ile Ala Thr Ser Glu Ile Asn Trp Asn Ser Met Ser
                115             120             125
```

```
   5    ctt gtt gtt gag cat tac tta tct ggc aga agc gag tat caa gga att    432
        Leu Val Val Glu His Tyr Leu Ser Gly Arg Ser Glu Tyr Gln Gly Ile
            130             135             140
```

```
        ggc ttt cta aat ctc aac gat aac gag att aat cga tgg cag gtg gtc    480
        Gly Phe Leu Asn Leu Asn Asp Asn Glu Ile Asn Arg Trp Gln Val Val
  10    145             150             155             160
```

```
        ata aaa tct cac tgt cag cat ata gct ttg cat cta gac cat gct gca    528
        Ile Lys Ser His Cys Gln His Ile Ala Leu His Leu Asp His Ala Ala
  15                  165             170             175
```

```
        agt aac ata act tgg aaa tct tta tac ccg gaa tgg att gac gag gaa    576
        Ser Asn Ile Thr Trp Lys Ser Leu Tyr Pro Glu Trp Ile Asp Glu Glu
                    180             185             190
```

```
  20    gaa aaa ttc aaa gtc ccc act tgt cct tct ctt cct tgg att caa gtt    624
        Glu Lys Phe Lys Val Pro Thr Cys Pro Ser Leu Pro Trp Ile Gln Val
                195             200             205
```

```
        cct gac aag tct cga atc gat ctt atc att gcc aag ctc cca tgt aac    672
  25    Pro Asp Lys Ser Arg Ile Asp Leu Ile Ile Ala Lys Leu Pro Cys Asn
                210             215             220
```

```
        aag tca gga aaa tgg tca aga gat gtg gct aga ttg cac tta caa ctt    720
        Lys Ser Gly Lys Trp Ser Arg Asp Val Ala Arg Leu His Leu Gln Leu
  30    225             230             235             240
```

```
        gca gca gct cga gtg gcg gca tct tct gaa ggg ctt cat gat gtt cat    768
        Ala Ala Ala Arg Val Ala Ala Ser Ser Glu Gly Leu His Asp Val His
  35                  245             250             255
```

```
        gtg att ttg gta tca gat tgc ttt cca ata ccg aat ctt ttt acg ggt    816
        Val Ile Leu Val Ser Asp Cys Phe Pro Ile Pro Asn Leu Phe Thr Gly
                    260             265             270
```

```
  40    caa gaa ctt gtt gcc cgt caa gga aac ata tgg ctg tat aag cct aaa    864
        Gln Glu Leu Val Ala Arg Gln Gly Asn Ile Trp Leu Tyr Lys Pro Lys
                275             280             285
```

```
        ctt cac cag tta aga caa aag tta caa ctt cct gtt ggt tcc tgt gaa    912
  45    Leu His Gln Leu Arg Gln Lys Leu Gln Leu Pro Val Gly Ser Cys Glu
                290             295             300
```

```
        ctt tct gtt cct ctt caa gct aaa gat aat ttc tac tcg gca aat gcc    960
        Leu Ser Val Pro Leu Gln Ala Lys Asp Asn Phe Tyr Ser Ala Asn Ala
  50    305             310             315             320
```

```
        aag aaa gaa gcg tac gcg acg atc ttg cac tca gat gat gct ttt gtc    1008
        Lys Lys Glu Ala Tyr Ala Thr Ile Leu His Ser Asp Asp Ala Phe Val
  55                  325             330             335
```

```
        tgt gga gcc att gca gta gca cag agc att cga atg tca ggc tct act    1056
        Cys Gly Ala Ile Ala Val Ala Gln Ser Ile Arg Met Ser Gly Ser Thr
                    340             345             350
```

```
  60    cgc aat ttg gta ata cta gtc gat gat tcg atc agt gaa tac cat aga    1104
        Arg Asn Leu Val Ile Leu Val Asp Asp Ser Ile Ser Glu Tyr His Arg
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<pre>
                 355   360   365

 5   agt ggc ttg gaa tca gct gga tgg aag att cac aca ttt caa aga atc   1152
      Ser Gly Leu Glu Ser Ala Gly Trp Lys Ile His Thr Phe Gln Arg Ile
          370   375   380

      aga aac ccg aaa gct gaa gca aat gca tat aac caa tgg aac tac agc   1200
      Arg Asn Pro Lys Ala Glu Ala Asn Ala Tyr Asn Gln Trp Asn Tyr Ser
      385   390   395   400
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      aaa ttc cgt ctt tgg gaa ttg aca gaa tac aac aag atc atc ttc att   1248
      Lys Phe Arg Leu Trp Glu Leu Thr Glu Tyr Asn Lys Ile Ile Phe Ile
                      405   410   415

15   gat gca gac atg ctt atc ctc aga aac atg gat ttc ctc ttc gag tac   1296
      Asp Ala Asp Met Leu Ile Leu Arg Asn Met Asp Phe Leu Phe Glu Tyr
                  420   425   430

20   ccc gaa atc tcc aca act gga aac gac ggt acg ctc ttc aac tcc ggt   1344
      Pro Glu Ile Ser Thr Thr Gly Asn Asp Gly Thr Leu Phe Asn Ser Gly
                  435   440   445

25   cta atg gtg att gaa cca tca aat tca aca ttc cag tta cta atg gat   1392
      Leu Met Val Ile Glu Pro Ser Asn Ser Thr Phe Gln Leu Leu Met Asp
          450   455   460

      cac atc aac gat atc aat tcc tac aat gga gga gac caa ggt tac ctt   1440
      His Ile Asn Asp Ile Asn Ser Tyr Asn Gly Gly Asp Gln Gly Tyr Leu
      465   470   475   480
30
      aac gag ata ttc aca tgg tgg cat cgg att cca aaa cac atg aat ttc   1488
      Asn Glu Ile Phe Thr Trp Trp His Arg Ile Pro Lys His Met Asn Phe
                      485   490   495

35   ttg aag cat ttc tgg gaa gga gac aca cct aag cac agg aaa tct aag   1536
      Leu Lys His Phe Trp Glu Gly Asp Thr Pro Lys His Arg Lys Ser Lys
                  500   505   510

40   acg aga cta ttt gga gct gat cct ccg ata ctc tac gtt ctt cat tac   1584
      Thr Arg Leu Phe Gly Ala Asp Pro Pro Ile Leu Tyr Val Leu His Tyr
          515   520   525

      cta ggt tac aac aaa cca tgg gta tgc ttc aga gac tac gat tgc aat   1632
      Leu Gly Tyr Asn Lys Pro Trp Val Cys Phe Arg Asp Tyr Asp Cys Asn
45   530   535   540

      tgg aat gtc gtt gga tac cat caa ttc gcg agc gat gaa gca cac aaa   1680
      Trp Asn Val Val Gly Tyr His Gln Phe Ala Ser Asp Glu Ala His Lys
      545   550   555   560
50
      act tgg tgg aga gtg cac gac gcg atg cct aag aaa ttg cag agg ttt   1728
      Thr Trp Trp Arg Val His Asp Ala Met Pro Lys Lys Leu Gln Arg Phe
                  565   570   575

55   tgt cta ctg agt tcg aaa caa aag gcg caa ctt gag tgg gat cgg aga   1776
      Cys Leu Leu Ser Ser Lys Gln Lys Ala Gln Leu Glu Trp Asp Arg Arg
                  580   585   590

60   caa gct gag aaa gcg aat tac aga gac gga cat tgg agg att aag atc   1824
      Gln Ala Glu Lys Ala Asn Tyr Arg Asp Gly His Trp Arg Ile Lys Ile
              595   600   605
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     aaa gat aag aga ctt acg act tgt ttt gaa gat ttc tgt ttc tgg gag   1872
     Lys Asp Lys Arg Leu Thr Thr Cys Phe Glu Asp Phe Cys Phe Trp Glu
         610             615                 620

     agt atg ctt tgg cat tgg ggt gag act cag acc aac tcc acc gtc gct   1920
     Ser Met Leu Trp His Trp Gly Glu Thr Gln Thr Asn Ser Thr Val Ala
     625             630                 635                 640

     gct gat tct tcc tcc acc gcg taa                                    1944
     Ala Asp Ser Ser Ser Thr Ala
                 645
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Ile Leu Thr Val Arg Met Lys Leu Ser Ser Glu Ser Pro Met Ala Pro
            20                  25                  30
Ser Ser Gln Ser Ser His Arg Leu Tyr Ile Ser Ser Glu Lys Thr Lys
            35                  40                  45
Thr Lys Arg Phe Gln Arg Asn Gly Tyr Thr Leu Asp Val Glu Met Cys
        50                  55                  60
Val Asn Phe Ser Ser Leu Lys Leu Val Leu Phe Leu Met Met Leu Val
 65                  70                  75                  80
Ala Met Phe Thr Leu Tyr Cys Ser Pro Pro Leu Gln Ile Pro Glu Asp
                85                  90                  95
Pro Ser Ser Phe Ala Asn Lys Trp Ile Leu Glu Pro Ala Val Thr Thr
            100                 105                 110
Asp Pro Arg Tyr Ile Ala Thr Ser Glu Ile Asn Trp Asn Ser Met Ser
            115                 120                 125
Leu Val Val Glu His Tyr Leu Ser Gly Arg Ser Glu Tyr Gln Gly Ile
        130                 135                 140
Gly Phe Leu Asn Leu Asn Asp Asn Glu Ile Asn Arg Trp Gln Val Val
145                 150                 155                 160
Ile Lys Ser His Cys Gln His Ile Ala Leu His Leu Asp His Ala Ala
                165                 170                 175
Ser Asn Ile Thr Trp Lys Ser Leu Tyr Pro Glu Trp Ile Asp Glu Glu
            180                 185                 190
Glu Lys Phe Lys Val Pro Thr Cys Pro Ser Leu Pro Trp Ile Gln Val
            195                 200                 205
Pro Asp Lys Ser Arg Ile Asp Leu Ile Ile Ala Lys Leu Pro Cys Asn
        210                 215                 220
Lys Ser Gly Lys Trp Ser Arg Asp Val Ala Arg Leu His Leu Gln Leu
225                 230                 235                 240
Ala Ala Ala Arg Val Ala Ala Ser Ser Glu Gly Leu His Asp Val His
                245                 250                 255
Val Ile Leu Val Ser Asp Cys Phe Pro Ile Pro Asn Leu Phe Thr Gly
            260                 265                 270
Gln Glu Leu Val Ala Arg Gln Gly Asn Ile Trp Leu Tyr Lys Pro Lys
        275                 280                 285
Leu His Gln Leu Arg Gln Lys Leu Gln Leu Pro Val Gly Ser Cys Glu
        290                 295                 300
Leu Ser Val Pro Leu Gln Ala Lys Asp Asn Phe Tyr Ser Ala Asn Ala
305                 310                 315                 320
Lys Lys Glu Ala Tyr Ala Thr Ile Leu His Ser Asp Asp Ala Phe Val
```

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                             325                        330                        335
         Cys Gly Ala Ile Ala Val Ala Gln Ser Ile Arg Met Ser Gly Ser Thr
                         340                        345                    350
 5       Arg Asn Leu Val Ile Leu Val Asp Asp Ser Ile Ser Glu Tyr His Arg
                     355                        360                    365
         Ser Gly Leu Glu Ser Ala Gly Trp Lys Ile His Thr Phe Gln Arg Ile
                 370                        375                    380
         Arg Asn Pro Lys Ala Glu Ala Asn Ala Tyr Asn Gln Trp Asn Tyr Ser
             385                        390                    395                    400
10       Lys Phe Arg Leu Trp Glu Leu Thr Glu Tyr Asn Lys Ile Ile Phe Ile
                         405                        410                    415
         Asp Ala Asp Met Leu Ile Leu Arg Asn Met Asp Phe Leu Phe Glu Tyr
                     420                        425                    430
         Pro Glu Ile Ser Thr Thr Gly Asn Asp Gly Thr Leu Phe Asn Ser Gly
15                   435                        440                    445
         Leu Met Val Ile Glu Pro Ser Asn Ser Thr Phe Gln Leu Leu Met Asp
                 450                        455                    460
         His Ile Asn Asp Ile Asn Ser Tyr Asn Gly Gly Asp Gln Gly Tyr Leu
             465                        470                    475                    480
20       Asn Glu Ile Phe Thr Trp Trp His Arg Ile Pro Lys His Met Asn Phe
                         485                        490                    495
         Leu Lys His Phe Trp Glu Gly Asp Thr Pro Lys His Arg Lys Ser Lys
                     500                        505                    510
         Thr Arg Leu Phe Gly Ala Asp Pro Pro Ile Leu Tyr Val Leu His Tyr
25                   515                        520                    525
         Leu Gly Tyr Asn Lys Pro Trp Val Cys Phe Arg Asp Tyr Asp Cys Asn
                 530                        535                    540
         Trp Asn Val Val Gly Tyr His Gln Phe Ala Ser Asp Glu Ala His Lys
             545                        550                    555                    560
30       Thr Trp Trp Arg Val His Asp Ala Met Pro Lys Lys Leu Gln Arg Phe
                         565                        570                    575
         Cys Leu Leu Ser Ser Lys Gln Lys Ala Gln Leu Glu Trp Asp Arg Arg
                     580                        585                    590
         Gln Ala Glu Lys Ala Asn Tyr Arg Asp Gly His Trp Arg Ile Lys Ile
35                   595                        600                    605
         Lys Asp Lys Arg Leu Thr Thr Cys Phe Glu Asp Phe Cys Phe Trp Glu
                 610                        615                    620
         Ser Met Leu Trp His Trp Gly Glu Thr Gln Thr Asn Ser Thr Val Ala
             625                        630                        635                    640
40       Ala Asp Ser Ser Ser Thr Ala
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         Met Ile Pro Ser Ser Ser Pro Met Glu Ser Arg His Arg Leu Ser Phe
           1               5                   10                  15


         tca aaa gag aag aca agt agg agg aga ttt caa aga att gag aag ggt   96
60       Ser Lys Glu Lys Thr Ser Arg Arg Arg Phe Gln Arg Ile Glu Lys Gly
                         20                  25                  30
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gtc aag ttc aac act ctg aaa ctt gtg ttg att tgt ata atg ctt gga   144
Val Lys Phe Asn Thr Leu Lys Leu Val Leu Ile Cys Ile Met Leu Gly
         35   40   45

gct ttg ttc acg atc tac cgt ttt cgt tat cca ccg cta caa att cct   192
Ala Leu Phe Thr Ile Tyr Arg Phe Arg Tyr Pro Pro Leu Gln Ile Pro
         50   55   60

gaa att cca act agt ttt ggt ctt act act gat cct cgc tat gta gct   240
Glu Ile Pro Thr Ser Phe Gly Leu Thr Thr Asp Pro Arg Tyr Val Ala
65   70   75   80

aca gct gag atc aac tgg aac cat atg tca aat ctt gtt gag aag cac   288
Thr Ala Glu Ile Asn Trp Asn His Met Ser Asn Leu Val Glu Lys His
                 85   90   95

gta ttt ggt aga agc gag tat caa gga att ggt ctt ata aat ctt aac   336
Val Phe Gly Arg Ser Glu Tyr Gln Gly Ile Gly Leu Ile Asn Leu Asn
             100   105   110

gat aac gag att gat cga ttc aag gag gta acg aaa tct gac tgt gat   384
Asp Asn Glu Ile Asp Arg Phe Lys Glu Val Thr Lys Ser Asp Cys Asp
         115   120   125

cat gta gct ttg cat cta gat tat gct gca aag aac ata aca tgg gaa   432
His Val Ala Leu His Leu Asp Tyr Ala Ala Lys Asn Ile Thr Trp Glu
     130   135   140

tct tta tac ccg gaa tgg att gat gaa gtt gaa gaa ttc gaa gtc cct   480
Ser Leu Tyr Pro Glu Trp Ile Asp Glu Val Glu Glu Phe Glu Val Pro
145   150   155   160

act tgt cct tct ctg cct ttg att caa att cct ggc aag cct cgg att   528
Thr Cys Pro Ser Leu Pro Leu Ile Gln Ile Pro Gly Lys Pro Arg Ile
                 165   170   175

gat ctt gta att gcc aag ctt ccg tgt gat aaa tca gga aaa tgg tct   576
Asp Leu Val Ile Ala Lys Leu Pro Cys Asp Lys Ser Gly Lys Trp Ser
             180   185   190

aga gat gtg gct cgc ttg cat tta caa ctt gca gca gct cga gtg gcg   624
Arg Asp Val Ala Arg Leu His Leu Gln Leu Ala Ala Ala Arg Val Ala
         195   200   205

gct tct tct aaa gga ctt cat aat gtt cat gtg att ttg gta tct gat   672
Ala Ser Ser Lys Gly Leu His Asn Val His Val Ile Leu Val Ser Asp
     210   215   220

tgc ttt cca ata ccg aat ctt ttt acg ggt caa gaa ctt gtt gcc cgt   720
Cys Phe Pro Ile Pro Asn Leu Phe Thr Gly Gln Glu Leu Val Ala Arg
225   230   235   240

caa gga aac ata tgg ctg tat aag cct aat ctt cac cag cta aga caa   768
Gln Gly Asn Ile Trp Leu Tyr Lys Pro Asn Leu His Gln Leu Arg Gln
                 245   250   255

aag tta cag ctt cct gtt ggt tcc tgt gaa ctt tct gtt cct ctt caa   816
Lys Leu Gln Leu Pro Val Gly Ser Cys Glu Leu Ser Val Pro Leu Gln
             260   265   270

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      gct aaa gat aat ttc tac tcc gca ggt gca aag aaa gaa gct tac gcg    864
      Ala Lys Asp Asn Phe Tyr Ser Ala Gly Ala Lys Lys Glu Ala Tyr Ala
              275             280             285

  5   act atc ttg cat tct gcc caa ttt tat gtc tgt gga gcc att gca gct    912
      Thr Ile Leu His Ser Ala Gln Phe Tyr Val Cys Gly Ala Ile Ala Ala
          290             295             300

 10   gca cag agc att cga atg tca ggc tct act cgt gat ctg gtc ata ctt    960
      Ala Gln Ser Ile Arg Met Ser Gly Ser Thr Arg Asp Leu Val Ile Leu
      305             310             315             320

      gtt gat gaa acg ata agc gaa tac cat aaa agt ggc ttg gta gct gct   1008
      Val Asp Glu Thr Ile Ser Glu Tyr His Lys Ser Gly Leu Val Ala Ala
                      325             330             335

 15   gga tgg aag att caa atg ttt caa aga atc agg aac ccg aat gct gta   1056
      Gly Trp Lys Ile Gln Met Phe Gln Arg Ile Arg Asn Pro Asn Ala Val
                  340             345             350

 20   cca aat gcc tac aac gaa tgg aac tac agc aag ttt cgt ctt tgg caa   1104
      Pro Asn Ala Tyr Asn Glu Trp Asn Tyr Ser Lys Phe Arg Leu Trp Gln
              355             360             365

 25   ctg act gaa tac agt aag atc atc ttc atc gat gca gac atg ctt atc   1152
      Leu Thr Glu Tyr Ser Lys Ile Ile Phe Ile Asp Ala Asp Met Leu Ile
          370             375             380

 30   ctg aga aac att gat ttc ctc ttc gag ttc cct gag ata tca gca act   1200
      Leu Arg Asn Ile Asp Phe Leu Phe Glu Phe Pro Glu Ile Ser Ala Thr
      385             390             395             400

 35   gga aac aat gct acg ctc ttc aac tct ggt cta atg gtg gtt gag cca   1248
      Gly Asn Asn Ala Thr Leu Phe Asn Ser Gly Leu Met Val Val Glu Pro
                      405             410             415

      tct aat tca aca ttc cag tta cta atg gat aac att aat gaa gtt gtg   1296
      Ser Asn Ser Thr Phe Gln Leu Leu Met Asp Asn Ile Asn Glu Val Val
                  420             425             430

 40   tct tac aac gga gga gac caa ggt tac ctt aac gag ata ttc aca tgg   1344
      Ser Tyr Asn Gly Gly Asp Gln Gly Tyr Leu Asn Glu Ile Phe Thr Trp
              435             440             445

 45   tgg cat cgg att cca aaa cac atg aat ttc ttg aag cat ttc tgg gaa   1392
      Trp His Arg Ile Pro Lys His Met Asn Phe Leu Lys His Phe Trp Glu
          450             455             460

 50   gga gac gaa cct gag att aaa aaa atg aag acg agt cta ttt gga gct   1440
      Gly Asp Glu Pro Glu Ile Lys Lys Met Lys Thr Ser Leu Phe Gly Ala
      465             470             475             480

 55   gat cct ccg atc cta tac gtt ctt cat tac cta ggt tat aac aaa ccc   1488
      Asp Pro Pro Ile Leu Tyr Val Leu His Tyr Leu Gly Tyr Asn Lys Pro
                      485             490             495

      tgg tta tgc ttc aga gac tat gac tgc aat tgg aat gtc gat att ttc   1536
      Trp Leu Cys Phe Arg Asp Tyr Asp Cys Asn Trp Asn Val Asp Ile Phe
                  500             505             510

 60   cag gaa ttt gct agt gac gag gct cat aaa acc tgg tgg aga gtg cac   1584
      Gln Glu Phe Ala Ser Asp Glu Ala His Lys Thr Trp Trp Arg Val His
```

```
        Gln Glu Phe Ala Ser Asp Glu Ala His Lys Thr Trp Trp Arg Val His
                515                 520                 525

   5    gac gca atg cct gaa aac ttg cat aag ttc tgt cta cta aga tcg aaa    1632
        Asp Ala Met Pro Glu Asn Leu His Lys Phe Cys Leu Leu Arg Ser Lys
                530                 535                 540

        cag aag gcg caa ctt gaa tgg gat agg aga caa gca gag aaa ggg aac    1680
        Gln Lys Ala Gln Leu Glu Trp Asp Arg Arg Gln Ala Glu Lys Gly Asn
  10    545                 550                 555                 560

        tac aaa gat gga cat tgg aag ata aag atc aaa gac aag aga ctt aag    1728
        Tyr Lys Asp Gly His Trp Lys Ile Lys Ile Lys Asp Lys Arg Leu Lys
                        565                 570                 575
  15
        act tgt ttc gaa gat ttc tgc ttt tgg gag agt atg ctt tgg cat tgg    1776
        Thr Cys Phe Glu Asp Phe Cys Phe Trp Glu Ser Met Leu Trp His Trp
                        580                 585                 590

  20    ggt gag acg aac tct acc aac aat tct tcc acc acc acc act tca tca    1824
        Gly Glu Thr Asn Ser Thr Asn Asn Ser Ser Thr Thr Thr Thr Ser Ser
                595                 600                 605

        ccg ccg cat aaa acc gct ctc cct tcc ctg tga                        1857
  25    Pro Pro His Lys Thr Ala Leu Pro Ser Leu
                610                 615
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  40    Val Lys Phe Asn Thr Leu Lys Leu Val Leu Ile Cys Ile Met Leu Gly
                35                  40                  45
        Ala Leu Phe Thr Ile Tyr Arg Phe Arg Tyr Pro Pro Leu Gln Ile Pro
              50                  55                  60
        Glu Ile Pro Thr Ser Phe Gly Leu Thr Thr Asp Pro Arg Tyr Val Ala
        65                  70                  75                  80
  45    Thr Ala Glu Ile Asn Trp Asn His Met Ser Asn Leu Val Glu Lys His
                        85                  90                  95
        Val Phe Gly Arg Ser Glu Tyr Gln Gly Ile Gly Leu Ile Asn Leu Asn
                    100                 105                 110
        Asp Asn Glu Ile Asp Arg Phe Lys Glu Val Thr Lys Ser Asp Cys Asp
                    115                 120                 125
  50    His Val Ala Leu His Leu Asp Tyr Ala Ala Lys Asn Ile Thr Trp Glu
                130                 135                 140
        Ser Leu Tyr Pro Glu Trp Ile Asp Glu Val Glu Glu Phe Glu Val Pro
        145                 150                 155                 160
        Thr Cys Pro Ser Leu Pro Leu Ile Gln Ile Pro Gly Lys Pro Arg Ile
  55                        165                 170                 175
        Asp Leu Val Ile Ala Lys Leu Pro Cys Asp Lys Ser Gly Lys Trp Ser
                        180                 185                 190
        Arg Asp Val Ala Arg Leu His Leu Gln Leu Ala Ala Ala Arg Val Ala
                195                 200                 205
  60    Ala Ser Ser Lys Gly Leu His Asn Val His Val Ile Leu Val Ser Asp
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                   210                      215                      220
        Cys Phe Pro Ile Pro Asn Leu Phe Thr Gly Gln Glu Leu Val Ala Arg
        225                      230                      235                      240
  5     Gln Gly Asn Ile Trp Leu Tyr Lys Pro Asn Leu His Gln Leu Arg Gln
                           245                      250                      255
        Lys Leu Gln Leu Pro Val Gly Ser Cys Glu Leu Ser Val Pro Leu Gln
                       260                      265                      270
        Ala Lys Asp Asn Phe Tyr Ser Ala Gly Ala Lys Lys Glu Ala Tyr Ala
                   275                      280                      285
 10     Thr Ile Leu His Ser Ala Gln Phe Tyr Val Cys Gly Ala Ile Ala Ala
               290                      295                      300
        Ala Gln Ser Ile Arg Met Ser Gly Ser Thr Arg Asp Leu Val Ile Leu
        305                      310                      315                      320
        Val Asp Glu Thr Ile Ser Glu Tyr His Lys Ser Gly Leu Val Ala Ala
 15                        325                      330                      335
        Gly Trp Lys Ile Gln Met Phe Gln Arg Ile Arg Asn Pro Asn Ala Val
                       340                      345                      350
        Pro Asn Ala Tyr Asn Glu Trp Asn Tyr Ser Lys Phe Arg Leu Trp Gln
                   355                      360                      365
 20     Leu Thr Glu Tyr Ser Lys Ile Ile Phe Ile Asp Ala Asp Met Leu Ile
               370                      375                      380
        Leu Arg Asn Ile Asp Phe Leu Phe Glu Phe Pro Glu Ile Ser Ala Thr
        385                      390                      395                      400
        Gly Asn Asn Ala Thr Leu Phe Asn Ser Gly Leu Met Val Val Glu Pro
 25                        405                      410                      415
        Ser Asn Ser Thr Phe Gln Leu Leu Met Asp Asn Ile Asn Glu Val Val
                       420                      425                      430
        Ser Tyr Asn Gly Gly Asp Gln Gly Tyr Leu Asn Glu Ile Phe Thr Trp
                   435                      440                      445
 30     Trp His Arg Ile Pro Lys His Met Asn Phe Leu Lys His Phe Trp Glu
               450                      455                      460
        Gly Asp Glu Pro Glu Ile Lys Lys Met Lys Thr Ser Leu Phe Gly Ala
        465                      470                      475                      480
        Asp Pro Pro Ile Leu Tyr Val Leu His Tyr Leu Gly Tyr Asn Lys Pro
 35                        485                      490                      495
        Trp Leu Cys Phe Arg Asp Tyr Asp Cys Asn Trp Asn Val Asp Ile Phe
                       500                      505                      510
        Gln Glu Phe Ala Ser Asp Glu Ala His Lys Thr Trp Trp Arg Val His
                   515                      520                      525
 40     Asp Ala Met Pro Glu Asn Leu His Lys Phe Cys Leu Leu Arg Ser Lys
               530                      535                      540
        Gln Lys Ala Gln Leu Glu Trp Asp Arg Arg Gln Ala Glu Lys Gly Asn
        545                      550                      555                      560
        Tyr Lys Asp Gly His Trp Lys Ile Lys Ile Lys Asp Lys Arg Leu Lys
 45                        565                      570                      575
        Thr Cys Phe Glu Asp Phe Cys Phe Trp Glu Ser Met Leu Trp His Trp
                       580                      585                      590
        Gly Glu Thr Asn Ser Thr Asn Asn Ser Ser Thr Thr Thr Thr Ser Ser
                   595                      600                      605
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        610                      615
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1				5					10					15		

gac	tcc	cgg	cga	cgc	ctc	tcc	gcg	tcc	ata	gaa	gca	ata	tgc	aag	agg	96
Asp	Ser	Arg	Arg	Arg	Leu	Ser	Ala	Ser	Ile	Glu	Ala	Ile	Cys	Lys	Arg	
			20					25					30			

aga	ttc	cgg	aga	aat	agc	aaa	gga	ggt	ggc	aga	tcg	gat	atg	gtg	aaa	144
Arg	Phe	Arg	Arg	Asn	Ser	Lys	Gly	Gly	Gly	Arg	Ser	Asp	Met	Val	Lys	
		35					40					45				

ccg	ttt	aat	atc	ata	aat	ttt	tcg	aca	caa	gac	aaa	aac	agt	agt	tgt	192
Pro	Phe	Asn	Ile	Ile	Asn	Phe	Ser	Thr	Gln	Asp	Lys	Asn	Ser	Ser	Cys	
	50					55					60					

tgt	tgt	ttc	acc	aag	ttt	cag	atc	gtg	aag	ctt	ctc	ttg	ttt	atc	ctt	240
Cys	Cys	Phe	Thr	Lys	Phe	Gln	Ile	Val	Lys	Leu	Leu	Leu	Phe	Ile	Leu	
65					70					75					80	

ctc	tct	gcc	act	ctc	ttc	acc	att	atc	tat	tct	cct	gaa	gct	tat	cat	288
Leu	Ser	Ala	Thr	Leu	Phe	Thr	Ile	Ile	Tyr	Ser	Pro	Glu	Ala	Tyr	His	
				85					90					95		

cat	tct	ctt	tcc	cac	tca	tct	tct	cga	tgg	ata	tgg	aga	aga	caa	gat	336
His	Ser	Leu	Ser	His	Ser	Ser	Ser	Arg	Trp	Ile	Trp	Arg	Arg	Gln	Asp	
			100					105					110			

cca	cgt	tac	ttc	tcg	gat	ctg	gat	ata	aac	tgg	gac	gat	gtg	act	aaa	384
Pro	Arg	Tyr	Phe	Ser	Asp	Leu	Asp	Ile	Asn	Trp	Asp	Asp	Val	Thr	Lys	
		115					120					125				

acc	ctt	gag	aac	atc	gaa	gaa	ggc	cgt	acg	atc	ggt	gtc	ttg	aat	ttt	432
Thr	Leu	Glu	Asn	Ile	Glu	Glu	Gly	Arg	Thr	Ile	Gly	Val	Leu	Asn	Phe	
	130					135					140					

gat	tcg	aac	gag	atc	caa	cga	tgg	aga	gaa	gta	tcc	aag	agc	aag	gac	480
Asp	Ser	Asn	Glu	Ile	Gln	Arg	Trp	Arg	Glu	Val	Ser	Lys	Ser	Lys	Asp	
145					150					155					160	

aat	ggg	gat	gaa	gaa	aaa	gtt	gtt	gta	ttg	aat	cta	gat	tac	gca	gac	528
Asn	Gly	Asp	Glu	Glu	Lys	Val	Val	Val	Leu	Asn	Leu	Asp	Tyr	Ala	Asp	
			165					170					175			

aag	aat	gtg	act	tgg	gac	gca	cta	tat	cca	gag	tgg	atc	gat	gag	gag	576
Lys	Asn	Val	Thr	Trp	Asp	Ala	Leu	Tyr	Pro	Glu	Trp	Ile	Asp	Glu	Glu	
			180					185					190			

caa	gaa	aca	gag	gtc	cct	gtt	tgt	cct	aat	atc	ccg	aac	att	aag	gta	624
Gln	Glu	Thr	Glu	Val	Pro	Val	Cys	Pro	Asn	Ile	Pro	Asn	Ile	Lys	Val	
		195					200					205				

cct	aca	aga	aga	ctc	gat	ctg	atc	gtc	gtg	aaa	ctt	cct	tgt	cgg	aaa	672
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gaa	ggg	aat	tgg	tcg	aga	gac	gtc	ggg	aga	ttg	cat	cta	cag	cta	gcg	720
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     Phe Phe Val Ser Arg Cys Phe Pro Ile Pro Asn Leu Phe Arg Cys Lys
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     gat ctt gtg tct cgg aga ggc gat gtt tgg ttg tac aaa cct aat ctt    864
     Asp Leu Val Ser Arg Arg Gly Asp Val Trp Leu Tyr Lys Pro Asn Leu
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 15  gat acc ttg aga gac aag ctt cag ctg cct gta ggg tct tgt gag cta    912
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     aga gaa gct tac gca aca att ctt cac tca gct cac gtt tac gtc tgc   1008
     Arg Glu Ala Tyr Ala Thr Ile Leu His Ser Ala His Val Tyr Val Cys
 25                  325             330             335

     ggt gca atc gcc gcg gct cag agc ata aga cag tct ggt tcg acg aga   1056
     Gly Ala Ile Ala Ala Ala Gln Ser Ile Arg Gln Ser Gly Ser Thr Arg
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     gac ctt gtt atc ctt gtt gat gac aac atc agc ggt tac cac cgg agt   1104
     Asp Leu Val Ile Leu Val Asp Asp Asn Ile Ser Gly Tyr His Arg Ser
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     gcg gat ctc tta atc ttg aga aac atc gat ttc ttg ttc tcg atg cct   1296
     Ala Asp Leu Leu Ile Leu Arg Asn Ile Asp Phe Leu Phe Ser Met Pro
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     gag atc tca gct aca gga aac aat gga act ctg ttt aat tca gga gtt   1344
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     Met Val Ile Glu Pro Cys Asn Cys Thr Phe Gln Leu Leu Met Glu His
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        ggg atg aag ccg tgg tta tgt tac cgt gac tac gac tgt aac ttc aac    1632
15      Gly Met Lys Pro Trp Leu Cys Tyr Arg Asp Tyr Asp Cys Asn Phe Asn
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        Gln Glu Thr Glu Val Pro Val Cys Pro Asn Ile Pro Asn Ile Lys Val
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     Met Ala Ala Ala Thr Thr Thr Thr Thr Thr Ser Ser Ser Ile Ser Phe
     1             5             10             15

     Ser Thr Lys Pro Ser Pro Ser Ser Ser Lys Ser Pro Leu Pro Ile Ser
25                 20             25             30

     Arg Phe Ser Leu Pro Phe Ser Leu Asn Pro Asn Lys Ser Ser Ser Ser
                 35             40             45

30   Ser Arg Arg Arg Gly Ile Lys Ser Ser Ser Pro Ser Ser Ile Ser Ala
                 50             55             60

     Val Leu Asn Thr Thr Thr Asn Val Thr Thr Thr Pro Ser Pro Thr Lys
     65             70             75             80
35

     Pro Thr Lys Pro Glu Thr Phe Ile Ser Arg Phe Ala Pro Asp Gln Pro
                 85             90             95

     Arg Lys Gly Ala Asp Ile Leu Val Glu Ala Leu Glu Arg Gln Gly Val
40                 100             105             110

     Glu Thr Val Phe Ala Tyr Pro Gly Gly Ala Ser Met Glu Ile His Gln
                 115             120             125

45   Ala Leu Thr Arg Ser Ser Ser Ile Arg Asn Val Leu Pro Arg His Glu
                 130             135             140

     Gln Gly Gly Val Phe Ala Ala Glu Gly Tyr Ala Arg Ser Ser Gly Lys
     145             150             155             160
50

     Pro Gly Ile Cys Ile Ala Thr Ser Gly Pro Gly Ala Thr Asn Leu Val
                 165             170             175

     Ser Gly Leu Ala Asp Ala Leu Leu Asp Ser Val Pro Leu Val Ala Ile
55                 180             185             190

     Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala Phe Gln Glu
                 195             200             205

60   Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys His Asn Tyr Leu
     210             215             220
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    Val Met Asp Val Glu Asp Ile Pro Arg Ile Ile Glu Glu Ala Phe Phe
    225             230             235             240

 5  Leu Ala Thr Ser Gly Arg Pro Gly Pro Val Leu Val Asp Val Pro Lys
                    245             250             255

    Asp Ile Gln Gln Gln Leu Ala Ile Pro Asn Trp Glu Gln Ala Met Arg
10      260             265             270

    Leu Pro Gly Tyr Met Ser Arg Met Pro Lys Pro Pro Glu Asp Ser His
            275             280             285

15  Leu Glu Gln Ile Val Arg Leu Ile Ser Glu Ser Lys Lys Pro Val Leu
        290             295             300

    Tyr Val Gly Gly Gly Cys Leu Asn Ser Ser Asp Glu Leu Gly Arg Phe
    305             310             315             320

20  Val Glu Leu Thr Gly Ile Pro Val Ala Ser Thr Leu Met Gly Leu Gly
                    325             330             335

    Ser Tyr Pro Cys Asp Asp Glu Leu Ser Leu His Met Leu Gly Met His
            340             345             350
25
    Gly Thr Val Tyr Ala Asn Tyr Ala Val Glu His Ser Asp Leu Leu Leu
            355             360             365

    Ala Phe Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Leu Glu Ala
30      370             375             380

    Phe Ala Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Ser Ala Glu
    385             390             395             400

35  Ile Gly Lys Asn Lys Thr Pro His Val Ser Val Cys Gly Asp Val Lys
                    405             410             415

    Leu Ala Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu Glu
            420             425             430
40
    Leu Lys Leu Asp Phe Gly Val Trp Arg Asn Glu Leu Asn Val Gln Lys
            435             440             445

    Gln Lys Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro Pro
45      450             455             460

    Gln Tyr Ala Ile Lys Val Leu Asp Glu Leu Thr Asp Gly Lys Ala Ile
    465             470             475             480

50  Ile Ser Thr Gly Val Gly Gln His Gln Met Trp Ala Ala Gln Phe Tyr
                    485             490             495

    Asn Tyr Lys Lys Pro Arg Gln Trp Leu Ser Ser Gly Gly Leu Gly Ala
            500             505             510
55
    Met Gly Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn Pro
            515             520             525

    Asp Ala Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met Asn
60      530             535             540
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```
      Val Gln Glu Leu Ala Thr Ile Arg Val Glu Asn Leu Pro Val Lys Val
      545                 550             555             560
5     Leu Leu Leu Asn Asn Gln His Leu Gly Met Val Met Gln Trp Glu Asp
                      565             570             575
      Arg Phe Tyr Lys Ala Asn Arg Ala His Thr Phe Leu Gly Asp Pro Ala
                  580             585             590
10    Gln Glu Asp Glu Ile Phe Pro Asn Met Leu Leu Phe Ala Ala Ala Cys
                  595             600             605
      Gly Ile Pro Ala Ala Arg Val Thr Lys Lys Ala Asp Leu Arg Glu Ala
          610             615             620
15    Ile Gln Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Val Ile
      625             630             635             640
      Cys Pro His Gln Glu His Val Leu Pro Met Ile Pro Asn Gly Gly Thr
20                565             650             655
      Phe Asn Asp Val Ile Thr Glu Gly Asp Gly Arg Ile Lys Tyr
                  660             665             670
25


      <210> 18
      <211> 259
      <212> DNA
30    <213> Artificial Sequence

      <220>
      <221> promoter
      <222> (1)..(259)
35
      <220>
      <223> Description of Artificial Sequence:be2promoter
            fragment

40    <400> 18
      gatctctaaa taattcgaaa tatctttgtt attatttttt tctattcaaa ttgcaattag 60
      acataagtca ttttaactga agctgcattg atgaaaaatt atactatgtc tttatgtata 120
      tatattaatg ttttaaattc ctttatagtg ataaagatgg ttcgaaacat gctacaaatt 180
      attatacgaa gttacttttt ttaatctact ttaacaattt tctaatttca ctattgaaca 240
45    tagataccag cccgggccg                                               259


      <210> 19
      <211> 400
50    <212> DNA
      <213> Artificial Sequence

      <220>
      <223> Description of Artificial Sequence:RNAi420be2be1
55
      <220>

      <400> 19
      gaattgttgt tctcatggac atcgttcaca gccatgcatc aaataatact ttagatggac 60
60    tgaacatgtt tgacggcacc gatagttgtt actttcactc tggagctcgt ggttatcatt 120
      ggatgtggga ttcccgcctc tttaactatg gaaactggga ggtacttagg tatcttctct 180
```

```
caaatgcgag atggtggttg ccatttcaca tcaccagaag gaatacctgg agttccagaa 240
acaaatttca atggtcgtcc aaattccttc aaagtgctgt ctcctgcgcg aacatgtgtg 300
gcttattaca gagttgacga acgcatgtca gaaactgaag tttaccagac agacatttct 360
agtgagctac taccaacagc caatatcgag gagagtgacg                     400
```

<210> 20
<211> 1105
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:RNAifragment

<220>

<400> 20
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gaattgttgt tctcatggac atcgttcaca gccatgcatc aaataatact ttagatggac 60
tgaacatgtt tgacggcacc gatagttgtt actttcactc tggagctcgt ggttatcatt 120
ggatgtggga ttcccgcctc tttaactatg gaaactggga ggtacttagg tatcttctct 180
caaatgcgag atggtggttg ccatttcaca tcaccagaag gaatacctgg agttccagaa 240
acaaatttca atggtcgtcc aaattccttc aaagtgctgt ctcctgcgcg aacatgtgtg 300
gcttattaca gagttgacga acgcatgtca gaaactgaag tttaccagac agacatttct 360
agtgagctac taccaacagc caatatcgag gagagtgacg atcaagctga tctctaaata 420
attcgaaata tctttgttat tattttttc tattcaaatt gcaattagac ataagtcatt 480
ttaactgaag ttgcattgat gaaaaattat actatgtttt atgtatatat attaattttt 540
aaattccttt atagtgataa agatagttcg aaacatgcta taaattatta tacgaattta 600
cgttactttt tttaatctac tttaacaatt ttctaatttc actattgaac atagatacca 660
gcccgggccg tcgacctcga attcgccctt ggagagtgac gttcgcgtca ctctcctcga 720
tattggctgt ggtagtagc tcactagaaa tgtctgtctg gtaaacttca gtttctgaca 780
tgcgttcgtc aactctgtaa taagccacac atgttcgcgc aggagacagc actttgaagg 840
aatttggacg accattgaaa tttgtttctg gaactccagg tattccttct ggtgatgtga 900
aatggcaacc accatctcgc atttgagaga agatacctaa gtacctccca gtttccatag 960
ttaaagaggc gggaatccca catccaatga taaccacgag ctccagagtg aaagtaacaa 1020
ctatcggtgc cgtcaaacat gttcagtcca tctaaagtat tatttgatgc atggctgtga 1080
acgatgtcca tgagaacaac aattc                                    1105
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<210> 21
<211> 180
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SBE RNAi 1

<220>

<400> 21
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actagtggta cttaggtatc ttctctcaaa tgcgagatgg tggttgagtg agctactacc 60
aacagccaat atcgaggaga gtgacgttcg cgtcactctc ctcgatattg gctgttggta 120
gtagctcact caaccaccat ctcgcatttg agagaagata cctaagtacc ttttggtacc 180
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<210> 22
<211> 420
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SBE RNAi 2

<400> 22
actagttgga gctcgtggtt atcattggat gtgggattcc cgcctcttta actatggaaa 60
ctgggaggta cttaggtatc ttctctcaaa tgcgagatgg tggttggctt attacagagt 120
tgacgaacgc atgtcagaaa ctgaagttta ccagacagac atttctagtg agctactacc 180
aacagccaat atcgaggaga gtgacgttcg cgtcactctc ctcgatattg gctgttggta 240
gtagctcact agaaatgtct gtctggtaaa cttcagtttc tgacatgcgt tcgtcaactc 300
tgtaataagc caaccaccat ctcgcatttg agagaagata cctaagtacc tcccagtttc 360
catagttaaa gaggcgggaa tcccacatcc aatgataacc acgagctcca ttttggtacc 420

<210> 23
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:spacer

<220>

<400> 23
atcaagctta tcgataccgt cgacctcgaa gcttgat   37

<210> 24
<211> 837
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:fragment of be2
      and be1 in pHAS3 for RNAi

<220>

<400> 24
gaattgttgt tctcatggac atcgttcaca gccatgcatc aaataatact ttagatggac 60
tgaacatgtt tgacggcacc gatagttgtt actttcactc tggagctcgt ggttatcatt 120
ggatgtggga ttcccgcctc tttaactatg gaaactggga ggtacttagg tatcttctct 180
caaatgcgag atggtggttg ccatttcaca tcaccagaag gaatacctgg agttccagaa 240
acaaatttca atggtcgtcc aaattccttc aaagtgctgt ctcctgcgcg aacatgtgtg 300
gcttattaca gagttgacga acgcatgtca gaaactgaag tttaccagac agacatttct 360
agtgagctac taccaacagc caatatcgag gagagtgacg atcaagctta tcgataccgt 420
cgacctcgaa gcttgatcgt cactctcctc gatattggct gttggtagta gctcactaga 480
aatgtctgtc tggtaaactt cagtttctga catgcgttcg tcaactctgt aataagccac 540
acatgttcgc gcaggagaca gcactttgaa ggaatttgga cgaccattga aatttgtttc 600
tggaactcca ggtattcctt ctggtgatgt gaaatggcaa ccaccatctc gcatttgaga 660
gaagatacct aagtacctcc cagtttccat agttaaagag gcgggaatcc cacatccaat 720
gataaccacg agctccagag tgaaagtaac aactatcggt gccgtcaaac atgttcagtc 780
catctaaagt attatttgat gcatggctgt gaacgatgtc catgagaaca acaattc 837